



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/772,315	02/06/2004	Jae-Dong Yoon	0630-1953P	6483
2292 7590 06/27/2008 BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747				
EXAMINER				
EWALD, MARIA VERONICA				
ART UNIT		PAPER NUMBER		
1791				
NOTIFICATION DATE		DELIVERY MODE		
06/27/2008		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary

Application No.

10/772,315

Applicant(s)

YOON ET AL.

Examiner

MARIA VERONICA D. EWALD

Art Unit

1791

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 March 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 and 23-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 and 23-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 – 6, 24 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bodkins, et al. (U.S. 3,544,518) in view of Ouellette (U.S. 6,419,476) and further in view of Wright, et al. (U.S. 6,422,857). Bodkins, et al. teach an injection mold comprising: a fixed mold having a passage for injecting a fluid therethrough and an internal space (figure 1; column 2, lines 55 – 60); a movable mold detachably attached to the fixed mold and forming a molding space together with the internal space of the fixed mold (figure 1; column 2, lines 55 – 60); and a same flow accelerating material means provided on the inner walls of both the fixed mold and the movable mold that form the molding space for increasing insulation of the fluid and reducing a flow resistance between the inner walls and the fluid so as to accelerate flow of the fluid injected into the injection mold (items 3 and 3' – figure 1; column 2, lines 57 – 62); wherein the same flow accelerating material means is a solid coating material (column 3, lines 45 – 63); wherein the solid coating material is a polymer coating material (column 3, lines 50 – 53); wherein the polymer used for the polymer coating material is PEEK (poly ether ether ketone) (column 3, lines 50 – 53); wherein the polymer coating

material is one of PTFE (polytetrafluoroethylene), PE (polyethylene), and methacrylates (column 3, lines 50 – 53); wherein the solid coating material is a ceramic coating material (column 3, lines 57 – 59). In addition, the reference teaches that the same flow accelerating material means is a solid coating material for increasing insulation of the fluid and reducing a flow resistance of the fluid, and wherein the solid coating material is at least one of PE (Polyethylene) and a methacrylate (column 3, lines 50 – 55); and wherein the same flow accelerating material means is a solid coating material for increasing insulation of the fluid and reducing a flow resistance of the fluid, and wherein the solid coating material is at least one of PEEK (Poly Ether Ether Ketone), PE (Polyethylene) and a methacrylate (column 3, lines 50 – 55).

However, Bodkins, et al. is silent with respect to any teaching of the same flow accelerating material means provided on the inner walls of a passage extending through the mold.

In a method to fabricate articles via injection molding, Ouellette teaches an improved injection molding apparatus with a runnerless manifold. The manifold is constructed of a low thermal conductive material, providing adequate insulation of the resin being injected (column 4, lines 60 – 65), thereby ensuring that the resin remains at a reasonable uncured molding temperature during one injection molding cycle (column 4, lines 65 – 67). The manifold is comprised of polymer bars (items 116 and 118 – figure 7) which is constructed of a high temperature polymer material having low thermal conductivity, high strength and rigidity (column 7, lines 61 – 65). The use of such material ensures that the resin material will not either cure prematurely or that the

Art Unit: 1791

thermoplastic will not solidify while in residence in the manifold (column 8, lines 35 – 45). As an alternative embodiment to the polymer bars, the flow channels may be constructed of a laminate of one or more polymeric materials (column 8, lines 45 – 60). Any resulting combination of laminates, again, ensures that the resin or thermoplastic is prevented from premature solidification.

Similarly, Wright, et al. teach a mold (item 16 – figure 1), which includes a passage or a "gate," which enters the internal mold cavity (item 26 – figure 1; column 3, lines 30 – 35). The gate is thermally insulated from the nozzle and the cavity via an insert (item 30 – figure 1). The insert is comprised of a low thermal conductivity material, which ensures that the resin temperature is maintained at its desirable value or range (column 5, lines 25 – 40). Wright, et al. thus teaches the criticality of the resin temperature and its correlation to adequate or successful injection molding (column 1, lines 15 – 20). If the resin temperature drops prior to reaching the cavity, thus, disrupting the melt flow (column 1, lines 20 – 25). Such temperature drops can result in defective or deformed mold parts or a multi-layer molded part comprising irregular thin layers (column 1, lines 20 – 25).

Thus, Bodkins, et al., Ouellette, and Wright, et al. teach the use of injection molding apparatus. Ouellette and Wright, et al. teach structural elements which preserve the resin temperature through any passage into which the resin flows, thereby emphasizing the importance of insulating the mold(s) surfaces, manifolds and the gate. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to modify the apparatus of Bodkins, et al. such that the manifold or

mold passage is coated with the same flow accelerating material means for the purpose of ensuring that the resin or thermoplastic does not prematurely solidify while in residence in the manifold.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bodkins et al. in view of Ouellette and further in view of Wright, et al. Bodkins, et al. teach an injection mold comprising: a fixed mold having a passage for introducing a fluid therethrough and an internal space (column 1, lines 28 – 30); a movable mold detachably attached to the fixed mold and forming a molding space together with the internal space of the fixed mold (figure 1; column 2, lines 55 – 60); and a flow accelerating means provided on an inner wall of the molding space for accelerating flow of the fluid; wherein the flow accelerating means is a solid coating for increasing insulation of the fluid and reducing a flow resistance between the inner wall and the fluid so as to accelerate flow of the fluid and wherein the solid coating material is a solid lubricant (items 3 and 3' – figure 1; column 2, lines 57 – 62).

However, Bodkins, et al. is silent with respect to any teaching of the same flow accelerating material means provided on the inner walls of a passage extending through the mold.

In a method to fabricate articles via injection molding, Ouellette teaches an improved injection molding apparatus with a runnerless manifold. The manifold is constructed of a low thermal conductive material, providing adequate insulation of the resin being injected (column 4, lines 60 – 65), thereby ensuring that the resin remains at

Art Unit: 1791

a reasonable uncured molding temperature during one injection molding cycle (column 4, lines 65 – 67). The manifold is comprised of polymer bars (items 116 and 118 – figure 7) which is constructed of a high temperature polymer material having low thermal conductivity, high strength and rigidity (column 7, lines 61 – 65). The use of such material ensures that the resin material will not either cure prematurely or that the thermoplastic will not solidify while in residence in the manifold (column 8, lines 35 – 45). As an alternative embodiment to the polymer bars, the flow channels may be constructed of a laminate of one or more polymeric materials (column 8, lines 45 – 60). Any resulting combination of laminates, again, ensures that the resin or thermoplastic is prevented from premature solidification.

Similarly, Wright, et al. teach a mold (item 16 – figure 1), which includes a passage or a “gate,” which enters the internal mold cavity (item 26 – figure 1; column 3, lines 30 – 35). The gate is thermally insulated from the nozzle and the cavity via an insert (item 30 – figure 1). The insert is comprised of a low thermal conductivity material, which ensures that the resin temperature is maintained at its desirable value or range (column 5, lines 25 – 40). Wright, et al. thus teaches the criticality of the resin temperature and its correlation to adequate or successful injection molding (column 1, lines 15 – 20). If the resin temperature drops prior to reaching the cavity, thus, disrupting the melt flow (column 1, lines 20 – 25). Such temperature drops can result in defective or deformed mold parts or a multi-layer molded part comprising irregular thin layers (column 1, lines 20 – 25).

Thus, Bodkins, et al., Ouellette, and Wright, et al. teach the use of injection molding apparatus. Ouellette and Wright, et al. teach structural elements which preserve the resin temperature through any passage into which the resin flows, thereby emphasizing the importance of insulating the mold(s) surfaces, manifolds and the gate. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to modify the apparatus of Bodkins, et al. such that the manifold or mold passage is coated with the same flow accelerating material means for the purpose of ensuring that the resin or thermoplastic does not prematurely solidify while in residence in the manifold.

Claims 12 – 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bodkins, et al. in view of Ouellette and further in view of Wright, et al. Bodkins, et al. teach a molding system comprising: a cylinder having an inlet and an outlet; a screw installed inside the cylinder and making a mold material and a mixture including a plastic introduced into the inlet of the cylinder flow toward the outlet; a heater for heating the mold material and mixture introduced in the cylinder (column 4, lines 35 – 45); a fixed mold having a passage for injecting a fluid therethrough and an internal space (figure 1); a movable mold detachably attached to the fixed mold and forming a molding space together with the internal space of the fixed mold (figure 1); and a same flow accelerating material means provided on the inner walls of both the fixed mold and the movable mold that form the molding space for increasing insulation of the fluid and reducing a flow resistance of the fluid (column 2, lines 57 – 62) so as to accelerate flow

Art Unit: 1791

of the fluid injected into the injection mold (items 3 and 3' – figure 1; column 2, lines 57 – 62); wherein a foaming agent supplier is provided at the side of the inlet of the cylinder to supply a foaming agent into the cylinder (column 4, lines 25 – 35); wherein a gas supplier is provided at the side of the inlet of the cylinder to supply a gas into the cylinder (column 4, lines 25 – 35); and wherein the flow accelerating means is a solid coating material.

However, Bodkins, et al. is silent with respect to any teaching of the same flow accelerating material means provided on the inner walls of a passage extending through the mold.

In a method to fabricate articles via injection molding, Ouellette teaches an improved injection molding apparatus with a runnerless manifold. The manifold is constructed of a low thermal conductive material, providing adequate insulation of the resin being injected (column 4, lines 60 – 65), thereby ensuring that the resin remains at a reasonable uncured molding temperature during one injection molding cycle (column 4, lines 65 – 67). The manifold is comprised of polymer bars (items 116 and 118 – figure 7) which is constructed of a high temperature polymer material having low thermal conductivity, high strength and rigidity (column 7, lines 61 – 65). The use of such material ensures that the resin material will not either cure prematurely or that the thermoplastic will not solidify while in residence in the manifold (column 8, lines 35 – 45). As an alternative embodiment to the polymer bars, the flow channels may be constructed of a laminate of one or more polymeric materials (column 8, lines 45 – 60).

Any resulting combination of laminates, again, ensures that the resin or thermoplastic is prevented from premature solidification.

Similarly, Wright, et al. teach a mold (item 16 – figure 1), which includes a passage or a “gate,” which enters the internal mold cavity (item 26 – figure 1; column 3, lines 30 – 35). The gate is thermally insulated from the nozzle and the cavity via an insert (item 30 – figure 1). The insert is comprised of a low thermal conductivity material, which ensures that the resin temperature is maintained at its desirable value or range (column 5, lines 25 – 40). Wright, et al. thus teaches the criticality of the resin temperature and its correlation to adequate or successful injection molding (column 1, lines 15 – 20). If the resin temperature drops prior to reaching the cavity, thus, disrupting the melt flow (column 1, lines 20 – 25). Such temperature drops can result in defective or deformed mold parts or a multi-layer molded part comprising irregular thin layers (column 1, lines 20 – 25).

Thus, Bodkins, et al., Ouellette, and Wright, et al. teach the use of injection molding apparatus. Ouellette and Wright, et al. teach structural elements which preserve the resin temperature through any passage into which the resin flows, thereby emphasizing the importance of insulating the mold(s) surfaces, manifolds and the gate. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to modify the apparatus of Bodkins, et al. such that the manifold or mold passage is coated with the same flow accelerating material means for the purpose of ensuring that the resin or thermoplastic does not prematurely solidify while in residence in the manifold.

Claims 1 – 7 and 24 – 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yotsutsuji, et al. (U.S. 4,225,109) in view of Ouellette and further in view of Wright, et al. Yotsutsuji, et al. teach an injection mold comprising: a fixed mold having a passage for injecting a fluid therethrough and an internal space (item 1 – figure 1; column 3, lines 50 – 51; column 4, lines 35 – 36); a movable mold detachably attached to the fixed mold and forming a molding space together with the internal space of the fixed mold (item 1' – figure 1; column 4, lines 30 – 33); and a same flow accelerating material means provided on the inner walls of both the fixed mold and the movable mold that form the molding space for increasing insulation of the fluid and reducing a flow resistance between the inner walls and the fluid so as to accelerate flow of the fluid injected into the injection mold (item 13 and 13' – figure 1; column 2, lines 45 – 60; column 4, lines 1 – 5, 30 – 35); wherein the same flow accelerating material means is a solid coating material (column 2, lines 45 – 60); wherein the solid coating material is a polymer coating material (column 4, lines 22 – 26); wherein the polymer used for the polymer coating material is PEEK (poly ether ether ketone) (column 4, lines 22 – 26); wherein the polymer coating material is one of PTFE (polytetrafluoroethylene), PE (polyethylene), and methacrylates (column 4, lines 22 – 26). The reference further teaches that the solid coating material is a ceramic coating material (column 4, lines 10 – 15); wherein the ceramic coating material is one of aluminum oxide and zirconium oxide (column 4, lines 15 – 19). In addition, the reference teaches that the same flow accelerating material means is a solid coating

material for increasing insulation of the fluid and reducing a flow resistance of the fluid, and wherein the solid coating material is at least one of PE (Polyethylene) and a methacrylate (column 3, lines 50 – 55); and wherein the same flow accelerating material means is a solid coating material for increasing insulation of the fluid and reducing a flow resistance of the fluid, and wherein the solid coating material is at least one of PEEK (Poly Ether Ether Ketone), PE (Polyethylene) and a methacrylate (column 3, lines 50 – 55).

Yotsutsuji, et al. however, is silent with respect to any teaching of the same flow accelerating material means provided on the inner walls of a passage extending through the mold.

In a method to fabricate articles via injection molding, Ouellette teaches an improved injection molding apparatus with a runnerless manifold. The manifold is constructed of a low thermal conductive material, providing adequate insulation of the resin being injected (column 4, lines 60 – 65), thereby ensuring that the resin remains at a reasonable uncured molding temperature during one injection molding cycle (column 4, lines 65 – 67). The manifold is comprised of polymer bars (items 116 and 118 – figure 7) which is constructed of a high temperature polymer material having low thermal conductivity, high strength and rigidity (column 7, lines 61 – 65). The use of such material ensures that the resin material will not either cure prematurely or that the thermoplastic will not solidify while in residence in the manifold (column 8, lines 35 – 45). As an alternative embodiment to the polymer bars, the flow channels may be constructed of a laminate of one or more polymeric materials (column 8, lines 45 – 60).

Any resulting combination of laminates, again, ensures that the resin or thermoplastic is prevented from premature solidification.

Similarly, Wright, et al. teach a mold (item 16 – figure 1), which includes a passage or a “gate,” which enters the internal mold cavity (item 26 – figure 1; column 3, lines 30 – 35). The gate is thermally insulated from the nozzle and the cavity via an insert (item 30 – figure 1). The insert is comprised of a low thermal conductivity material, which ensures that the resin temperature is maintained at its desirable value or range (column 5, lines 25 – 40). Wright, et al. thus teaches the criticality of the resin temperature and its correlation to adequate or successful injection molding (column 1, lines 15 – 20). If the resin temperature drops prior to reaching the cavity, thus, disrupting the melt flow (column 1, lines 20 – 25). Such temperature drops can result in defective or deformed mold parts or a multi-layer molded part comprising irregular thin layers (column 1, lines 20 – 25).

Thus, Yotsutsuji, et al., Ouellette, and Wright, et al. teach the use of injection molding apparatus. Ouellette and Wright, et al. teach structural elements which preserve the resin temperature through any passage into which the resin flows, thereby emphasizing the importance of insulating the mold(s) surfaces, manifolds and the gate. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to modify the apparatus of Yotsutsuji, et al. such that the manifold or mold passage is coated with the same flow accelerating material means for the purpose of ensuring that the resin or thermoplastic does not prematurely solidify while in residence in the manifold.

Claims 8 – 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yotsutsuji, et al. in view of Ouellette and further in view of Wright, et al. Yotsutsuji, et al. teach an injection mold comprising: a fixed mold having a passage for introducing a fluid therethrough and an internal space (item 1 – figure 1; column 3, lines 50 – 51; column 4, lines 35 – 36); a movable mold detachably attached to the fixed mold and forming a molding space together with the internal space of the fixed mold (item 1' – figure 1; column 4, lines 30 – 33); and a flow accelerating means provided on an inner wall of the molding space for accelerating flow of the fluid; wherein the flow accelerating means is a solid coating for increasing insulation of the fluid and reducing a flow resistance between the inner wall and the fluid so as to accelerate flow of the fluid and wherein the solid coating material is a solid lubricant (item 12 – figure 1; column 2, lines 45 – 60; column 3, lines 50 – 60); wherein the solid lubricant is one of graphite, molybdenum and disulfide (column 4, lines 1 – 3, 10 – 15).

Yotsutsuji, et al. however, is silent with respect to any teaching of the same flow accelerating material means provided on a passage extending through the mold.

In a method to fabricate articles via injection molding, Ouellette teaches an improved injection molding apparatus with a runnerless manifold. The manifold is constructed of a low thermal conductive material, providing adequate insulation of the resin being injected (column 4, lines 60 – 65), thereby ensuring that the resin remains at a reasonable uncured molding temperature during one injection molding cycle (column 4, lines 65 – 67). The manifold is comprised of polymer bars (items 116 and 118 – figure 7) which is constructed of a high temperature polymer material having low thermal

conductivity, high strength and rigidity (column 7, lines 61 – 65). The use of such material ensures that the resin material will not either cure prematurely or that the thermoplastic will not solidify while in residence in the manifold (column 8, lines 35 – 45). As an alternative embodiment to the polymer bars, the flow channels may be constructed of a laminate of one or more polymeric materials (column 8, lines 45 – 60). Any resulting combination of laminates, again, ensures that the resin or thermoplastic is prevented from premature solidification.

Similarly, Wright, et al. teach a mold (item 16 – figure 1), which includes a passage or a “gate,” which enters the internal mold cavity (item 26 – figure 1; column 3, lines 30 – 35). The gate is thermally insulated from the nozzle and the cavity via an insert (item 30 – figure 1). The insert is comprised of a low thermal conductivity material, which ensures that the resin temperature is maintained at its desirable value or range (column 5, lines 25 – 40). Wright, et al. thus teaches the criticality of the resin temperature and its correlation to adequate or successful injection molding (column 1, lines 15 – 20). If the resin temperature drops prior to reaching the cavity, thus, disrupting the melt flow (column 1, lines 20 – 25). Such temperature drops can result in defective or deformed mold parts or a multi-layer molded part comprising irregular thin layers (column 1, lines 20 – 25).

Thus, Yotsutsuji, et al., Ouellette, and Wright, et al. teach the use of injection molding apparatus. Ouellette and Wright, et al. teach structural elements which preserve the resin temperature through any passage into which the resin flows, thereby emphasizing the importance of insulating the mold(s) surfaces, manifolds and the gate.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to modify the apparatus of Yotsutsuji, et al. such that the manifold or mold passage is coated with the same flow accelerating material means for the purpose of ensuring that the resin or thermoplastic does not prematurely solidify while in residence in the manifold.

Claims 10 – 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yotsutsuji, et al. in view of Ouellette and further in view of Wright, et al. Yotsutsuji, et al. teach an injection mold comprising: a fixed mold having a passage for introducing a fluid therethrough and an internal space (item 1 – figure 1; column 3, lines 50 – 51; column 4, lines 35 – 36); a movable mold detachably attached to the fixed mold and forming a molding space together with the internal space of the fixed mold (item 1' – figure 1; column 4, lines 30 – 33); and a flow accelerating means provided on an inner wall of the molding space for accelerating flow of the fluid (column 2, lines 45 – 60; column 3, lines 55 – 65); wherein the flow accelerating means is a solid coating metal material for increasing insulation of the fluid and reducing a flow resistance between the inner wall and the fluid so as to accelerate flow of the fluid, and wherein the solid coating material is a solid metal (item 12 – figure 1; column 2, lines 45 – 60; column 3, lines 50 – 60); wherein the solid coating metal material is one of lead, indium, cadmium, tin and silver (column 3, lines 55 – 62).

Yotsutsuji, et al. however, is silent with respect to any teaching of the same flow accelerating material means provided a passage extending through the mold.

In a method to fabricate articles via injection molding, Ouellette teaches an improved injection molding apparatus with a runnerless manifold. The manifold is constructed of a low thermal conductive material, providing adequate insulation of the resin being injected (column 4, lines 60 – 65), thereby ensuring that the resin remains at a reasonable uncured molding temperature during one injection molding cycle (column 4, lines 65 – 67). The manifold is comprised of polymer bars (items 116 and 118 – figure 7) which is constructed of a high temperature polymer material having low thermal conductivity, high strength and rigidity (column 7, lines 61 – 65). The use of such material ensures that the resin material will not either cure prematurely or that the thermoplastic will not solidify while in residence in the manifold (column 8, lines 35 – 45). As an alternative embodiment to the polymer bars, the flow channels may be constructed of a laminate of one or more polymeric materials (column 8, lines 45 – 60). Any resulting combination of laminates, again, ensures that the resin or thermoplastic is prevented from premature solidification.

Similarly, Wright, et al. teach a mold (item 16 – figure 1), which includes a passage or a “gate,” which enters the internal mold cavity (item 26 – figure 1; column 3, lines 30 – 35). The gate is thermally insulated from the nozzle and the cavity via an insert (item 30 – figure 1). The insert is comprised of a low thermal conductivity material, which ensures that the resin temperature is maintained at its desirable value or range (column 5, lines 25 – 40). Wright, et al. thus teaches the criticality of the resin temperature and its correlation to adequate or successful injection molding (column 1, lines 15 – 20). If the resin temperature drops prior to reaching the cavity, thus,

disrupting the melt flow (column 1, lines 20 – 25). Such temperature drops can result in defective or deformed mold parts or a multi-layer molded part comprising irregular thin layers (column 1, lines 20 – 25).

Thus, Yotsutsuji, et al., Ouellette, and Wright, et al. teach the use of injection molding apparatus. Ouellette and Wright, et al. teach structural elements which preserve the resin temperature through any passage into which the resin flows, thereby emphasizing the importance of insulating the mold(s) surfaces, manifolds and the gate. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to modify the apparatus of Yotsutsuji, et al. such that the manifold or mold passage is coated with the same flow accelerating material means for the purpose of ensuring that the resin or thermoplastic does not prematurely solidify while in residence in the manifold.

Claims 12 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yotsutsuji, et al. in view of Ouellette and further in view of Wright, et al. Yotsutsuji, et al. teach a molding system comprising: a cylinder having an inlet and an outlet; a screw installed inside the cylinder and making a mold material and a mixture including a plastic introduced into the inlet of the cylinder flow toward the outlet; a heater for heating the mold material and mixture introduced in the cylinder (column 3, lines 45 – 50; column 4, lines 30 – 35, 45 – 55); a fixed mold having a passage for injecting a fluid therethrough and an internal space (item 1 – figure 1); a movable mold detachably attached to the fixed mold and forming a molding space together with the internal space

Art Unit: 1791

of the fixed mold (item 1' – figure 1); and a same flow accelerating material means provided on the inner walls of both the fixed mold and the movable mold that form the molding space for increasing insulation of the fluid and reducing a flow resistance between the inner walls and the fluid so as to accelerate flow of the fluid injected into the injection mold (item 12 and 12' – figure 1; column 2, lines 45 – 60; column 4, lines 1 – 5, 30 – 35); wherein the flow accelerating means is a solid coating material (item 12 and 12' – figure 1; column 2, lines 45 – 60; column 4, lines 1 – 5, 30 – 35).

Yotsutsuji, et al. however, is silent with respect to any teaching of the same flow accelerating material means provided on a passage extending through the mold.

In a method to fabricate articles via injection molding, Ouellette teaches an improved injection molding apparatus with a runnerless manifold. The manifold is constructed of a low thermal conductive material, providing adequate insulation of the resin being injected (column 4, lines 60 – 65), thereby ensuring that the resin remains at a reasonable uncured molding temperature during one injection molding cycle (column 4, lines 65 – 67). The manifold is comprised of polymer bars (items 116 and 118 – figure 7) which is constructed of a high temperature polymer material having low thermal conductivity, high strength and rigidity (column 7, lines 61 – 65). The use of such material ensures that the resin material will not either cure prematurely or that the thermoplastic will not solidify while in residence in the manifold (column 8, lines 35 – 45). As an alternative embodiment to the polymer bars, the flow channels may be constructed of a laminate of one or more polymeric materials (column 8, lines 45 – 60).

Any resulting combination of laminates, again, ensures that the resin or thermoplastic is prevented from premature solidification.

Similarly, Wright, et al. teach a mold (item 16 – figure 1), which includes a passage or a “gate,” which enters the internal mold cavity (item 26 – figure 1; column 3, lines 30 – 35). The gate is thermally insulated from the nozzle and the cavity via an insert (item 30 – figure 1). The insert is comprised of a low thermal conductivity material, which ensures that the resin temperature is maintained at its desirable value or range (column 5, lines 25 – 40). Wright, et al. thus teaches the criticality of the resin temperature and its correlation to adequate or successful injection molding (column 1, lines 15 – 20). If the resin temperature drops prior to reaching the cavity, thus, disrupting the melt flow (column 1, lines 20 – 25). Such temperature drops can result in defective or deformed mold parts or a multi-layer molded part comprising irregular thin layers (column 1, lines 20 – 25).

Thus, Yotsutsuji, et al., Ouellette, and Wright, et al. teach the use of injection molding apparatus. Ouellette and Wright, et al. teach structural elements which preserve the resin temperature through any passage into which the resin flows, thereby emphasizing the importance of insulating the mold(s) surfaces, manifolds and the gate. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to modify the apparatus of Yotsutsuji, et al. such that the manifold or mold passage is coated with the same flow accelerating material means for the purpose of ensuring that the resin or thermoplastic does not prematurely solidify while in residence in the manifold.

Claims 1 – 3, 5, 24, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hendry (U.S. 4,201,742) in view of Ouellette and further in view of Wright, et al. Hendry teaches a fixed mold having a passage for injecting a fluid therethrough and an internal space (item 12 – figure 1); a movable mold detachably attached to the fixed mold and forming a molding space together with the internal space of the fixed mold (item 10 – figure 1); and a same flow accelerating material means provided on the inner walls of both the fixed mold and the movable mold that form the molding space for accelerating flow of the fluid injected into the injection mold (column 3, lines 55 – 60); wherein the same flow accelerating material means is a solid coating material for increasing insulation of the fluid and reducing a flow resistance of the fluid (column 3, lines 55 – 60); wherein the solid coating material is a polymer coating material and wherein the polymer coating material is one of PTFE (polytetrafluoroethylene), PE (polyethylene) and methacrylates (column 3, lines 55 – 57). Furthermore, the reference teaches that the same flow accelerating material means is a solid coating material for increasing insulation of the fluid and reducing a flow resistance of the fluid, and wherein the solid coating material is at least one of PE (Polyethylene) and a methacrylate (column 3, lines 50 – 55); and wherein the same flow accelerating material means is a solid coating material for increasing insulation of the fluid and reducing a flow resistance of the fluid, and wherein the solid coating material is at least one of PEEK (Poly Ether Ether Ketone), PE (Polyethylene) and a methacrylate (column 3, lines 50 – 55).

Hendry however, is silent with respect to any teaching of the same flow accelerating material means provided on a passage extending through the mold.

In a method to fabricate articles via injection molding, Ouellette teaches an improved injection molding apparatus with a runnerless manifold. The manifold is constructed of a low thermal conductive material, providing adequate insulation of the resin being injected (column 4, lines 60 – 65), thereby ensuring that the resin remains at a reasonable uncured molding temperature during one injection molding cycle (column 4, lines 65 – 67). The manifold is comprised of polymer bars (items 116 and 118 – figure 7) which is constructed of a high temperature polymer material having low thermal conductivity, high strength and rigidity (column 7, lines 61 – 65). The use of such material ensures that the resin material will not either cure prematurely or that the thermoplastic will not solidify while in residence in the manifold (column 8, lines 35 – 45). As an alternative embodiment to the polymer bars, the flow channels may be constructed of a laminate of one or more polymeric materials (column 8, lines 45 – 60). Any resulting combination of laminates, again, ensures that the resin or thermoplastic is prevented from premature solidification.

Similarly, Wright, et al. teach a mold (item 16 – figure 1), which includes a passage or a “gate,” which enters the internal mold cavity (item 26 – figure 1; column 3, lines 30 – 35). The gate is thermally insulated from the nozzle and the cavity via an insert (item 30 – figure 1). The insert is comprised of a low thermal conductivity material, which ensures that the resin temperature is maintained at its desirable value or range (column 5, lines 25 – 40). Wright, et al. thus teaches the criticality of the resin

temperature and its correlation to adequate or successful injection molding (column 1, lines 15 – 20). If the resin temperature drops prior to reaching the cavity, thus, disrupting the melt flow (column 1, lines 20 – 25). Such temperature drops can result in defective or deformed mold parts or a multi-layer molded part comprising irregular thin layers (column 1, lines 20 – 25).

Thus, Hendry, Ouellette, and Wright, et al. teach the use of injection molding apparatus. Ouellette and Wright, et al. teach structural elements which preserve the resin temperature through any passage into which the resin flows, thereby emphasizing the importance of insulating the mold(s) surfaces, manifolds and the gate. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to modify the apparatus of Hendry such that the manifold or mold passage is coated with the same flow accelerating material means for the purpose of ensuring that the resin or thermoplastic does not prematurely solidify while in residence in the manifold.

Claims 12 – 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hendry in view of Ouellette and further in view of Hendry. Hendry teaches a molding system comprising: a cylinder having an inlet and an outlet; a screw installed inside the cylinder and making a mold material and a mixture including a plastic introduced into the inlet of the cylinder flow toward the outlet; a heater for heating the mold material and mixture introduced in the cylinder (column 2, lines 65 – 68; column 6, lines 20 – 30); a fixed mold having a passage for injecting a fluid therethrough and an internal space

(item 12 – figure 1); a movable mold detachably attached to the fixed mold and forming a molding space together with the internal space of the fixed mold (item 10 – figure 1); and a same flow accelerating material means provided on the inner walls of both the fixed mold and the movable mold that form the molding space for increasing insulation of the fluid and reducing a flow resistance of the fluid (column 3, lines 55 – 60) so as to accelerate flow of the fluid injected into the injection mold (column 3, lines 55 – 60); wherein a foaming agent supplier is provided at the side of the inlet of the cylinder to supply a foaming agent into the cylinder (column 1, lines 15 – 25); wherein a gas supplier is provided at the side of the inlet of the cylinder to supply a gas into the cylinder (column 1, lines 15 – 25); and wherein the flow accelerating means is a solid coating material.

Hendry however, is silent with respect to any teaching of the same flow accelerating material means provided a passage extending through the mold.

In a method to fabricate articles via injection molding, Ouellette teaches an improved injection molding apparatus with a runnerless manifold. The manifold is constructed of a low thermal conductive material, providing adequate insulation of the resin being injected (column 4, lines 60 – 65), thereby ensuring that the resin remains at a reasonable uncured molding temperature during one injection molding cycle (column 4, lines 65 – 67). The manifold is comprised of polymer bars (items 116 and 118 – figure 7) which is constructed of a high temperature polymer material having low thermal conductivity, high strength and rigidity (column 7, lines 61 – 65). The use of such material ensures that the resin material will not either cure prematurely or that the

thermoplastic will not solidify while in residence in the manifold (column 8, lines 35 – 45). As an alternative embodiment to the polymer bars, the flow channels may be constructed of a laminate of one or more polymeric materials (column 8, lines 45 – 60). Any resulting combination of laminates, again, ensures that the resin or thermoplastic is prevented from premature solidification.

Similarly, Wright, et al. teach a mold (item 16 – figure 1), which includes a passage or a "gate," which enters the internal mold cavity (item 26 – figure 1; column 3, lines 30 – 35). The gate is thermally insulated from the nozzle and the cavity via an insert (item 30 – figure 1). The insert is comprised of a low thermal conductivity material, which ensures that the resin temperature is maintained at its desirable value or range (column 5, lines 25 – 40). Wright, et al. thus teaches the criticality of the resin temperature and its correlation to adequate or successful injection molding (column 1, lines 15 – 20). If the resin temperature drops prior to reaching the cavity, thus, disrupting the melt flow (column 1, lines 20 – 25). Such temperature drops can result in defective or deformed mold parts or a multi-layer molded part comprising irregular thin layers (column 1, lines 20 – 25).

Thus, Hendry, Ouellette, and Wright, et al. teach the use of injection molding apparatus. Ouellette and Wright, et al. teach structural elements which preserve the resin temperature through any passage into which the resin flows, thereby emphasizing the importance of insulating the mold(s) surfaces, manifolds and the gate. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to modify the apparatus of Hendry such that the manifold or mold passage is

coated with the same flow accelerating material means for the purpose of ensuring that the resin or thermoplastic does not prematurely solidify while in residence in the manifold.

Claims 1 – 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kataoka, et al. (U.S. 5,362,226) in view of Ouellette and further in view of Wright, et al. Kataoka, et al. teach an injection mold comprising: a fixed mold having a passage for injecting a fluid therethrough and an internal space (figure 1; column 2, lines 55 – 60); a movable mold detachably attached to the fixed mold and forming a molding space together with the internal space of the fixed mold (figure 1; column 2, lines 55 – 60); and a same flow accelerating material means provided on the inner walls of both the fixed mold and the movable mold that form the molding space for increasing insulation of the fluid and reducing a flow resistance between the inner walls and the fluid so as to accelerate flow of the fluid injected into the injection mold (column 1, lines 45 – 55); wherein the same flow accelerating material means is a solid coating material (column 1, lines 50 – 55); wherein the solid coating material is a polymer coating material (column 1, lines 50 – 55).

Kataoka, et al., however, is silent with respect to any teaching of the same flow accelerating material means provided on a passage extending through the mold.

In a method to fabricate articles via injection molding, Ouellette teaches an improved injection molding apparatus with a runnerless manifold. The manifold is constructed of a low thermal conductive material, providing adequate insulation of the

resin being injected (column 4, lines 60 – 65), thereby ensuring that the resin remains at a reasonable uncured molding temperature during one injection molding cycle (column 4, lines 65 – 67). The manifold is comprised of polymer bars (items 116 and 118 – figure 7) which is constructed of a high temperature polymer material having low thermal conductivity, high strength and rigidity (column 7, lines 61 – 65). The use of such material ensures that the resin material will not either cure prematurely or that the thermoplastic will not solidify while in residence in the manifold (column 8, lines 35 – 45). As an alternative embodiment to the polymer bars, the flow channels may be constructed of a laminate of one or more polymeric materials (column 8, lines 45 – 60). Any resulting combination of laminates, again, ensures that the resin or thermoplastic is prevented from premature solidification.

Similarly, Wright, et al. teach a mold (item 16 – figure 1), which includes a passage or a “gate,” which enters the internal mold cavity (item 26 – figure 1; column 3, lines 30 – 35). The gate is thermally insulated from the nozzle and the cavity via an insert (item 30 – figure 1). The insert is comprised of a low thermal conductivity material, which ensures that the resin temperature is maintained at its desirable value or range (column 5, lines 25 – 40). Wright, et al. thus teaches the criticality of the resin temperature and its correlation to adequate or successful injection molding (column 1, lines 15 – 20). If the resin temperature drops prior to reaching the cavity, thus, disrupting the melt flow (column 1, lines 20 – 25). Such temperature drops can result in defective or deformed mold parts or a multi-layer molded part comprising irregular thin layers (column 1, lines 20 – 25).

Thus, Kataoka, et al., Ouellette, and Wright, et al. teach the use of injection molding apparatus. Ouellette and Wright, et al. teach structural elements which preserve the resin temperature through any passage into which the resin flows, thereby emphasizing the importance of insulating the mold(s) surfaces, manifolds and the gate. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to modify the apparatus of Kataoka, et al. such that the manifold or mold passage is coated with the same flow accelerating material means for the purpose of ensuring that the resin or thermoplastic does not prematurely solidify while in residence in the manifold.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kataoka, et al. in view of Ouellette and further in view of Wright, et al. Kataoka, et al. teach an injection mold comprising: a fixed mold having a passage for introducing a fluid therethrough and an internal space (figure 1; column 2, lines 55 – 60); a movable mold detachably attached to the fixed mold and forming a molding space together with the internal space of the fixed mold (figure 1; column 2, lines 55 – 60); and a flow accelerating means provided on an inner wall of the molding space for accelerating flow of the fluid; wherein the flow accelerating means is a solid coating for increasing insulation of the fluid and reducing a flow resistance between the inner wall and the fluid so as to accelerate flow of the fluid and wherein the solid coating material is a solid lubricant (column 1, lines 50 – 55).

Kataoka, et al., however, is silent with respect to any teaching of the same flow accelerating material means provided on a passage extending through the mold.

In a method to fabricate articles via injection molding, Ouellette teaches an improved injection molding apparatus with a runnerless manifold. The manifold is constructed of a low thermal conductive material, providing adequate insulation of the resin being injected (column 4, lines 60 – 65), thereby ensuring that the resin remains at a reasonable uncured molding temperature during one injection molding cycle (column 4, lines 65 – 67). The manifold is comprised of polymer bars (items 116 and 118 – figure 7) which is constructed of a high temperature polymer material having low thermal conductivity, high strength and rigidity (column 7, lines 61 – 65). The use of such material ensures that the resin material will not either cure prematurely or that the thermoplastic will not solidify while in residence in the manifold (column 8, lines 35 – 45). As an alternative embodiment to the polymer bars, the flow channels may be constructed of a laminate of one or more polymeric materials (column 8, lines 45 – 60). Any resulting combination of laminates, again, ensures that the resin or thermoplastic is prevented from premature solidification.

Similarly, Wright, et al. teach a mold (item 16 – figure 1), which includes a passage or a “gate,” which enters the internal mold cavity (item 26 – figure 1; column 3, lines 30 – 35). The gate is thermally insulated from the nozzle and the cavity via an insert (item 30 – figure 1). The insert is comprised of a low thermal conductivity material, which ensures that the resin temperature is maintained at its desirable value or range (column 5, lines 25 – 40). Wright, et al. thus teaches the criticality of the resin

temperature and its correlation to adequate or successful injection molding (column 1, lines 15 – 20). If the resin temperature drops prior to reaching the cavity, thus, disrupting the melt flow (column 1, lines 20 – 25). Such temperature drops can result in defective or deformed mold parts or a multi-layer molded part comprising irregular thin layers (column 1, lines 20 – 25).

Thus, Kataoka, et al., Ouellette, and Wright, et al. teach the use of injection molding apparatus. Ouellette and Wright, et al. teach structural elements which preserve the resin temperature through any passage into which the resin flows, thereby emphasizing the importance of insulating the mold(s) surfaces, manifolds and the gate. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to modify the apparatus of Kataoka, et al. such that the manifold or mold passage is coated with the same flow accelerating material means for the purpose of ensuring that the resin or thermoplastic does not prematurely solidify while in residence in the manifold.

Claims 12 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kataoka, et al. in view of Ouellette and further in view of Wright, et al. Kataoka, et al. teach a molding system comprising: a cylinder having an inlet and an outlet; a screw installed inside the cylinder and making a mold material and a mixture including a plastic introduced into the inlet of the cylinder flow toward the outlet; a heater for heating the mold material and mixture introduced in the cylinder (column 12, lines 1 – 15); a fixed mold having a passage for injecting a fluid therethrough and an internal space

(column 2, lines 55 – 60); a movable mold detachably attached to the fixed mold and forming a molding space together with the internal space of the fixed mold (column 2, lines 55 – 60); and a same flow accelerating material means provided on the inner walls of both the fixed mold and the movable mold that form the molding space for increasing insulation of the fluid and reducing a flow resistance between the inner walls and the fluid so as to accelerate flow of the fluid injected into the injection mold (column 1, lines 50 – 55); wherein the flow accelerating means is a solid coating material (column 1, lines 50 – 55).

Kataoka, et al., however, is silent with respect to any teaching of the same flow accelerating material means provided on a passage extending through the mold.

In a method to fabricate articles via injection molding, Ouellette teaches an improved injection molding apparatus with a runnerless manifold. The manifold is constructed of a low thermal conductive material, providing adequate insulation of the resin being injected (column 4, lines 60 – 65), thereby ensuring that the resin remains at a reasonable uncured molding temperature during one injection molding cycle (column 4, lines 65 – 67). The manifold is comprised of polymer bars (items 116 and 118 – figure 7) which is constructed of a high temperature polymer material having low thermal conductivity, high strength and rigidity (column 7, lines 61 – 65). The use of such material ensures that the resin material will not either cure prematurely or that the thermoplastic will not solidify while in residence in the manifold (column 8, lines 35 – 45). As an alternative embodiment to the polymer bars, the flow channels may be constructed of a laminate of one or more polymeric materials (column 8, lines 45 – 60).

Any resulting combination of laminates, again, ensures that the resin or thermoplastic is prevented from premature solidification.

Similarly, Wright, et al. teach a mold (item 16 – figure 1), which includes a passage or a “gate,” which enters the internal mold cavity (item 26 – figure 1; column 3, lines 30 – 35). The gate is thermally insulated from the nozzle and the cavity via an insert (item 30 – figure 1). The insert is comprised of a low thermal conductivity material, which ensures that the resin temperature is maintained at its desirable value or range (column 5, lines 25 – 40). Wright, et al. thus teaches the criticality of the resin temperature and its correlation to adequate or successful injection molding (column 1, lines 15 – 20). If the resin temperature drops prior to reaching the cavity, thus, disrupting the melt flow (column 1, lines 20 – 25). Such temperature drops can result in defective or deformed mold parts or a multi-layer molded part comprising irregular thin layers (column 1, lines 20 – 25).

Thus, Kataoka, et al., Ouellette, and Wright, et al. teach the use of injection molding apparatus. Ouellette and Wright, et al. teach structural elements which preserve the resin temperature through any passage into which the resin flows, thereby emphasizing the importance of insulating the mold(s) surfaces, manifolds and the gate. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to modify the apparatus of Kataoka, et al. such that the manifold or mold passage is coated with the same flow accelerating material means for the purpose of ensuring that the resin or thermoplastic does not prematurely solidify while in residence in the manifold.

Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sayer (U.S. 4,923,667) in view of Wright, et al. and further in view of Bodkins, et al., Yotsutsuji, et al., Hendry or Kataoka, et al. Sayer teaches a cylinder having an inlet and an outlet (item 17 – figure 1); a screw installed inside the cylinder and making a mold material and a mixture including plastic into the inlet of the cylinder flow toward the outlet (figure 1; column 4, lines 30 – 35); a heater for heating the mold material and mixture introduced in the cylinder (column 4, lines 30 – 35); a fixed mold (item 11 – figure 1) having a passage extending through the mold, the passage having an inner wall for injecting a fluid therethrough and an internal space (item 20 – figure 1); and a movable mold detachably attached to the fixed mold and forming a molding space together with the internal space of the fixed mold (item 12 – figure 1).

Sayer, however, fails to teach that there is a flow accelerating means provided on the inner walls of the both the fixed and movable molds and wherein the same flow accelerating means is provided on the inner wall of the fixed mold passage.

Wright, et al. teach a mold (item 16 – figure 1), which includes a passage or a “gate,” which enters the internal mold cavity (item 26 – figure 1; column 3, lines 30 – 35). The gate is thermally insulated from the nozzle and the cavity via an insert (item 30 – figure 1). The insert is comprised of a low thermal conductivity material, which ensures that the resin temperature is maintained at its desirable value or range (column 5, lines 25 – 40). Wright, et al. thus teaches the criticality of the resin temperature and its correlation to adequate or successful injection molding (column 1, lines 15 – 20). If the resin temperature drops prior to reaching the cavity, thus, disrupting the melt flow

(column 1, lines 20 – 25). Such temperature drops can result in defective or deformed mold parts or a multi-layer molded part comprising irregular thin layers (column 1, lines 20 – 25).

Similarly, Bodkins, et al., Yotsutsuji, et al., Hendry or Kataoka, et al. teach injection molding systems, wherein a flow accelerating means is provided on the mold surfaces, respectively. The flow accelerating means (whether a lubricant, a polymer coating or solid coating) insulates and thereby ensures that the resin remains in its fluid or molten state to prevent premature cooling or solidification and also ensures that the entire mold cavity is adequately filled uniformly with the resin.

Response to Arguments

14. Applicant's arguments with respect to claim 23 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's arguments with respect to the remaining rejections in which the reference of Ouellette was applied as a secondary reference have been fully considered but they are not persuasive. Applicant argues that the secondary reference of Ouellette fails to teach an inlet mold passage. Examiner agrees on this point. However, the reference of Ouellette has been cited because the manifold of Ouellette is coated or structured with polymer bars to maintain the fluid flow of the resin. Furthermore, item 130, identified by Applicant as the mold passage, is not the mold, but a manifold which is exterior to the mold and connects to the mold surface, thereby transporting resin to the mold entrance. The manifold of Ouellette is coated for the same purpose as that

Art Unit: 1791

shown in the primary references of Bodkins, et al., Yotsutsuji, et al., Hendry and Kataoka, et al. - to ensure that the resin remains in its less viscous state, thereby maintaining its fluidity.

Applicant's arguments, however, with respect to the newly-amended feature of the fixed mold having a passage extending through the mold is persuasive. Applicant argues that the primary references cited previously do not teach a passage extending through the fixed mold, which is coated with the same flow accelerating means as that of the mold surfaces. The Examiner agrees and thus, in light of the new claim amendments, the Examiner has cited the reference of Wright, et al. Wright, et al. teach the criticality of the resin temperature and maintaining the resin in its fluent state prior to complete filling of the cavity to prevent premature solidification. Premature cooling or solidification can result in defective products. Thus, Wright, et al. teach the presence of an insulated gate which extends through the fixed mold. The insulation ensures that the resin is maintained in its fluent state. Thus, it would have been obvious to one of ordinary skill in the art of injection molding to coat or insulate the gate with the same material as that of the mold surfaces, for the same purpose of maintaining the appropriate temperature of the resin, ensuring that the resin flows adequately into the mold cavity, thereby preventing the production of defective plastic products.

Conclusion

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MARIA VERONICA D. EWALD whose telephone number is (571)272-8519. The examiner can normally be reached on M-F, 8 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Yogendra Gupta can be reached on 571-272-1316. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1791

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Yogendra N Gupta/
Supervisory Patent Examiner, Art Unit 1791

MVE